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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,113	11/13/2001	Junichi Taniguchi	D-1172	6453

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EXAMINER
GURZO, PAUL M

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 05/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/987,113	Applicant(s) TANIGUCHI, JUNICHI	
	Examiner Paul Gurzo	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 May 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 5-9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Douglas (5,179,278) and further in view of Bier (5,750,993).

Regarding claim 1, Douglas teaches an ion trap mass spectrometer comprising an ion supply source (12) and an ion storing section (44) disposed between the ions supply source and the ion trap (58) providing an RF electric field (col. 2, lines 43-44 and Fig. 1) with an axial electric potential (col. 4, lines 46-49). He also teaches applying a high voltage on the plate (40), which will subsequently act as an entrance gate electrode (col. 4, lines 36-38) for introducing the ions. He also teaches applying another voltage on the plate (52) (col. 4, lines 34-36), which will subsequently act as an exit gate electrode for emitting the ions to the ion trap (58). He teaches that these two plates will reflect the ions back and forth and will also reject unwanted ions (col. 5, lines 55-67). These steps are controlled by a controller (71) (col. 4, lines 23-28).

Douglas does not teach the step of controlling the RF voltage to the ion trap, but it would be obvious to control this trap as is known in the art as taught by Bier. Bier teaches the after introduction of ions into the ion trap, the RF voltage is applied to the trap (col. 3, lines 17-19). He teaches that the ions can be blocked by applying a low RF voltage (col. 3, lines 28-30). This teaches on the claimed cutoff of RF voltage. Further, the act of suddenly applying the RF

voltage to retain the ions is considered obvious to the teachings because an RF voltage is needed for the ion trap to operate successfully. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the desired voltages to the ion trap because these voltages will ensure that the ion trap will store the proper amount of desired ions for the purpose of spectrometry.

Regarding claim 5, Douglas teaches the use of an ion lens (56) disposed between the exit gate electrode and the ion trap (col. 2, lines 52-56 and Fig. 1).

Regarding claims 6 and 7, Douglas teaches the control means connected to the gate electrodes and storing section, and Bier teaches controlling the ion trap as described above. Further, it is considered obvious that since the gate electrodes are receiving a voltage that they are able to open and close to promote the desired storing and subsequent releasing into the ion trap. Douglas teaches this claimed closing of the exit electrode (col. 4, lines 31-34). He also teaches rejecting ions of unwanted mass (col. 5, lines 55-67).

Regarding claims 8 and 9, Douglas teaches that unwanted ions are ejected by means of an RF voltage (which will produce an RF electric field) (col. 5, lines 55-67). These ions will be excluded from the storing section before they are introduced into the ion trap. Further, the application of an RF electric field is considered obvious in view of Douglas. These unwanted ions are rejected and will not be collected for introduction to the ion trap (col. 6, lines 62-67).

Claims 2, 3, and 10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Douglas (5,179,278), in view of Bier (5,750,993), and further in view of Baba et al. (5,783,824).

Regarding claim 2, the above-applied prior art does not explicitly teach the use of resistors in connection with multipole electrodes. However, Baba et al. teach that the electrodes

(63') are connected to resistors with an appropriate resistance (R) (col. 9, lines 53-61, col. 18, lines 24-45, col. 21, lines 15-37, and Fig. 12). This connection reads on the claim that the electrodes are formed of a resistor. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use resistors with the multipole electrode design so that ions are resonantly oscillated along the direction of the central axis of the electrode structure.

Regarding claim 3, Baba et al. depict the claimed plural sections divided in a longitudinal direction (Fig. 12) and teach the independent application of DC voltages (col. 15, lines 49-55).

Regarding claim 10, Baba et al. teach the cooling of the ions by collisions with helium gas (col. 16, lines 42-52). Though they teach this cooling in the ion trap itself, it is known that cooling is prevalent in the art, and this teaching can be extended to include cooling in the storing section instead of the ion trap.

Claim 4 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Douglas (5,179,278), in view of Bier (5,750,993), and further in view of Smith et al. (6,107,628).

The above-applied prior art does not explicitly teach a plurality of annular electrodes with an independent application of DC and RF voltages. However, Smith et al. teach that RF voltages are applied to the annular rings (col. 3, lines 24-38) and a DC voltage supply (350) provides a voltage that is fed to each of the rings (col. 10, lines 20-23 and Fig. 3). Fig. 3 clearly depicts that claimed independent application of the DC voltage and the RF voltage application will act in the much the same manner. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this independent application because it help to define the proper confinement zone for the ions as they travel.

Response to Arguments

Applicant's arguments filed on May 1, 2003 have been fully considered but they are not persuasive. Applicant claims that the Douglas reference does not teach axial electric potential applied to the rods (44) or gathering ions near the exit side of the ion storing section. However, these rods are viewed as electrodes, and it is well known in the art of ion trap mass spectrometry and the use of electrodes for storing, etc. that they will obviously have electric potential because the application of a voltage to the electrodes will cause an electric potential. In addition, it is obvious that the ions are gathered near the exit side of the ion-storing region because this gathering is needed so that the ions are able to enter the ion trap section.

Applicant further states that the Bier reference teaches application of RF voltage to the ion trap (24), not the octopoles (19 and 23) (page 7, lines 29-30). Applicant agrees that the ion trap has an RF voltage applied to it as taught by Bier, and Applicant claims, in claim 1, that an ion trap section comprises a means for cutting off an RF voltage while the bunch of ions enter the section, and a means for applying the RF voltage when a desired amount of ions are in the ion trap section. Therefore, the Examiner maintains that the Bier reference does, in fact, teach the claimed application of an RF voltage to the ion trap as claimed.

Applicant argues that Baba et al. does not teach a means for providing the RF electric field to provide the axial electric potential. However, the above applied prior art does teach such a potential as taught above, and the use of the Baba et al. reference is merely used to show the claimed "at least one part of the multipole electrodes being formed of a resistor." Applicant agrees, on page 8, that the Baba et al. reference does teach electrodes connected to resistors.

Applicant argues that the Smith et al. reference does not teach an ion storing section. However, Smith et al. teach an increase in the RF voltage applied to the poles or rings to obtain effective confinement (col. 3, lines 30-32). This teaches on the claimed ion storing section.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Gurzo whose telephone number is (703) 306-0532. The examiner can normally be reached on M-Thurs. 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on (703) 308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

PMG
May 9, 2003

JOHN R. LEE
SUPERVISORY
TECH